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Chapter 5

Child maltreatment and social connectedness among formerly institutionalized females: Links with depression

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Abstract

This study aimed to examine the effects of child maltreatment subtypes (physical abuse, sexual abuse, neglect, and exposure to domestic violence) and cumulative child maltreatment on depressive symptoms in adulthood, and examine the protective effects of social connectedness in a sample of formerly institutionalized females. The sample consisted of 124 females who were institutionalized in a Dutch juvenile justice institution during adolescence and were followed-up when they were on average 32 years old. Information about child maltreatment was extracted from treatment files. Retrospective data on social connectedness in young adulthood were established during interviews using a Life History Calendar. Relationship quality at follow-up was assessed with items derived from the Rochester Youth Development Study. The Center for Epidemiological Studies Scale for Depression (CES-D) was used to measure depressive symptoms in adulthood. Results showed that 85.5% of the females experienced child maltreatment, and co-occurrence of subtypes was high. Cumulative child maltreatment increased the risk of depression in adulthood. Furthermore, social connectedness, that is, more employment over time and the quality of the romantic relationship at follow-up, protected against the development of depression. However, social connectedness did not buffer the effect of maltreatment on depression. Our findings indicate that treatment of these girls should focus on improving the social-emotional development to promote positive interpersonal relationships and include educational and vocational components to guide these girls toward increased opportunities on the labor market.

Child maltreatment increases the risk of various mental health problems (Gilbert et al., 2009), among which depression figures prominently (Widom, DuMont, & Czaja, 2007). However, not all maltreated children develop depressive symptoms later in life. A substantial proportion of maltreated children seem to be resilient to the effects of maltreatment (e.g., Collishaw et al., 2007). Increasingly, research suggests that social factors, such as friendships and adult romantic relationships, serve as protective factors against the negative effects of child maltreatment (e.g., Collishaw et al., 2007). Although the association between child maltreatment, depression, and protective factors is extensively studied in the general population, research among antisocial or delinquent samples, particularly females, is scarce (Wong, Slotboom, & Bijleveld, 2010). In the literature, several terms are used to refer to these youth, such as juvenile delinquents or offenders, justice-involved youth, or institutionalized youth. In our study, we use the term *high-risk youth* to indicate antisocial and delinquent adolescents and young adults who were exposed to adverse developmental contexts and families. High-risk females are especially vulnerable to psychopathology and experience more child maltreatment than males (e.g., McCabe, Lansing, Garland, & Hough, 2002; Teplin, Welty, Abram, Dulcan, & Washburn, 2012), therefore research among this group is desperately needed.

Child maltreatment and depression in high-risk youth

The scarce evidence suggests that high-risk youth experience more frequent and more severe child maltreatment than the general population, including child sexual abuse (CSA), child physical abuse (CPA), exposure to domestic violence (DV), and neglect (Abram et al., 2004; Dixon, Howie, & Starling, 2004). Similar to research among the general population, child maltreatment is associated with depression in high-risk youth (e.g., Wanklyn, Day, Hart, & Girard, 2012). However, the evidence among high-risk females is inconsistent. Some studies found no significant association between depression and CSA (Goodkind, Ng, & Sarri, 2006; Gover, 2004; van Vugt, Lanctôt, Paquette, Collin-Vézina, & Lemieux, 2014) or CPA (Coleman & Stewart, 2010), while others found an increased risk of mental health problems associated with CSA (King et al., 2011; Wareham & Dembo, 2007) or CPA (Goodkind, Ruffolo, Bybee, & Sarri, 2009).

These inconsistencies may emerge from a variety of factors. First, most studies among high-risk females focused on CSA and CPA. Less is known about neglect and exposure to DV, which are not only frequent among high-risk youth but also likely to be associated with an increased risk of depression (Ariga et al., 2008). In addition, maltreated children are often victims of multiple subtypes of maltreatment, which results in poorer mental health (Edwards, Holden, Felitti, & Anda, 2003; Radford, Corral, Bradley, & Fisher, 2013). High-risk females are particularly likely to experience

multiple adverse life events (Ford, Grasso, Hawke, & Chapman, 2013). The current study includes CSA, CPA, as well as neglect and exposure to DV, to examine the co-occurrence of subtypes of maltreatment and investigate the cumulative effect of different subtypes on depression. Second, studies differed in their assessment of depression, ranging from affective disorders (King et al., 2011) to general psychological functioning (Wareham & Dembo, 2007). Here, we focus on depressive symptoms. Third, previous studies examined the link between child maltreatment and mental health at the time of institutionalization or detention (e.g., Gover, 2004; King et al., 2011; Wareham & Dembo, 2007). So far, only one prospective study examined the relation between child maltreatment and depression in adulthood among high-risk females (van Vugt et al., 2014). This study explored this link longitudinally to gain insight into the causal relationship between maltreatment and depression.

Social connectedness as a protective factor

While high-risk youth, especially females, show an increased risk for depression and a high prevalence of child maltreatment, we know little about protective factors. One factor that may protect against developing depression is social connectedness, which is defined as the degree to which people are connected with others (Lee & Robbins, 1998). Research suggests that intimate, close relationships, relationships with peers and strangers, and even participation in the community have beneficial effects on people's well-being (e.g., Holt-Lunstad, Smith, & Layton, 2010; Lee & Robbins, 1998). Some research suggests that social connectedness is not only linked to well-being but may also buffer the adverse effects of risk factors and adversities among maltreated youth (Collishaw et al., 2007). For example, social isolation is a risk factor for developing mental health problems (Heinrich & Gullone, 2006) and increases the risk of adverse long-term effects of child maltreatment (Kunst, Bogaerts, & Winkel, 2010). Thus, social connectedness may serve as a buffer for the negative effects of child maltreatment.

Intimate and close relationships constitute an important category in social connectedness. Yet, social relationships do not reflect the full scope of social connectedness. Other social networks, such as social networks at the workplace, may provide a more reliable context to buffer against the negative effects of maltreatment, especially among high-risk youth. To illustrate, close relationships in high-risk samples are generally short-lived and/or problematic (Lanctôt, Cernkovich, & Giordano, 2007). Moreover, child maltreatment and juvenile delinquency are both related to difficulties in forming stable and positive interpersonal relationships in adulthood (Colman & Widom, 2004; Lanctôt et al., 2007). In the absence of positive close relationships, employment may provide high-risk females with the opportunity to interact with others on a regular, longer-lasting basis, and reduce the risk of mental health problems (Paul

& Moser, 2009). Therefore, studying employment as a factor of social connectedness is essential. To illustrate, employment is associated with more social contacts, which mediates the relation between unemployment and mental health (Selenko, Batinic, & Paul, 2011). Moreover, employment plays a causal role in positive mental health (Paul & Moser, 2009). Nevertheless, unemployment rates are especially high among high-risk females (e.g., van der Molen et al., 2013; Verbruggen, Blokland, & van der Geest, 2012).

Research suggests that employment buffers from developing mental health problems among survivors of intimate partner violence (Adams, Bybee, Tolman, Sullivan, & Kennedy, 2013; Carlson, McNutt, Choi, & Rose, 2002). However, this buffering effect has not yet been studied in high-risk females and victims of child maltreatment. Taken together, these findings highlight the role of employment as an indicator of social connectedness and potential buffer for deleterious effects of child maltreatment among high-risk females.

Overview of the study

Previous research highlights the need to explore the association between child maltreatment and depression, and to examine protective factors to decrease the risk of depression in high-risk females. Understanding these associations may yield important implications for the treatment of high-risk females. The present study sought to (a) explore the prevalence of child maltreatment, including CSA, CPA, neglect, and exposure to DV; (b) examine effects of child maltreatment on depressive symptoms in adulthood; and (c) examine social connectedness, including both employment and romantic relationships, as a protective factor for depression, among a considerable sample of females who were institutionalized in a Dutch juvenile justice institution during adolescence. Participants were observed from 18 to a maximum of 38 years of age. This is, to our knowledge, the first longitudinal study that examines the association between child maltreatment and depressive symptoms and the moderating role of social connectedness, in a high-risk sample of formerly institutionalized female.

Based on previous research, we expected (a) high rates of child maltreatment, (b) a significant association between child maltreatment and depression, and (c) that having experienced multiple subtypes of maltreatment predicts more depressive symptoms. Extending the existing literature, we predicted that (d) females with greater social connectedness over time (i.e., more consistent employment and/or more romantic relationships) would be less likely to develop depressive symptoms than females with less social connectedness, (e) social connectedness (i.e., employment and romantic relationships) moderates the effect of child maltreatment on depressive symptoms. Specifically, we expected that the negative relation between maltreatment and depressive symptoms would be stronger for females with lower social connectedness

than for females with greater social connectedness. In addition, we predicted that the different indicators of social connectedness differentially affect well-being among formerly institutionalized females in that (f) employment should emerge as a stronger protective factor than the frequency of romantic relationships, and (g) the quality of their romantic relationship should emerge as a protective factor for females in a relationship at follow-up.

Method

Sample

The original sample consisted of 270 girls who were institutionalized as adolescents in a judicial treatment institution for juveniles in the Netherlands. Until recently, treatment in such an institution in the Netherlands could be imposed as a criminal law measure as well as a civil law measure. A criminal law measure could be imposed when a juvenile committed an offense, for example, violent offenses (e.g., assault) or property offenses (e.g., theft), and was between 12 and 18 years old. A civil law measure could be imposed when it was impossible for a minor to live at home as a result of, for example, behavioral problems or an adverse family situation. All girls discharged between 1990 and March 1999, who were institutionalized for at least 2 months, and whose treatment files were available, were approached for participation in the study. The girls were institutionalized because they displayed serious behavioral problems, often including delinquency, for which they needed treatment. Treatment was aimed at reducing the girls' behavior problems, as well as providing them with education.

Participants were approached for a follow-up interview when most of them were in their early 30s. From the original 270 girls, 8 had died and 10 had emigrated within the follow-up period, and could therefore not be approached for the interview. A number of participants were living in secure living arrangements (such as sheltered living or a psychiatric institution). Two institutions refused to collaborate so that two participants could not be approached for the study.

Of the remaining 250 "approachable" participants, 79 refused, 32 could not be contacted after six to eight attempts, 3 participants were reached but were too ill to participate (acute psychosis in 2 cases, 1 case was unclear), and 3 participants did not turn up (repeatedly) for the appointment. A total of 133 participants ($M = 32.9$, $SD = 2.5$) participated in the study (53.2% response rate). Response rates in similar follow-up studies range from 48.9% (van Vugt et al., 2014) to 85.8% (Cernkovich, Lanctôt, & Giordano, 2008). There were some differences between participants and non-responders on background characteristics in the sample. Specifically, as compared

with responders, non-responders were more likely to have no permanent home and women were more likely to be sexually abused. However, there were no differences in other background characteristics (e.g., socioeconomic status [SES], psychopathology, IQ, and employment). Nine participants did not complete the interview, leaving 124 women with complete data in the study (for information about the sample see Megens & Day, 2007; Verbruggen et al., 2012).

Procedure

Participants' treatment files, which were constructed during their stay in the judicial treatment institution, and were held in the archive of the institution, were analyzed to collect information of Time 1. The treatment files were scored in the archive of the institution in 2004-2005 and 2009-2010 by four trained students who signed a confidentiality agreement. The interview study started at the end of 2010 and was completed in January 2012. The women first received a letter with information about the study. They were told that the purpose of the study was to gain insight into their experience with the institution and life after leaving the institution. After having given informed consent, trained interviewers visited women at their current residence (e.g., home, prison, treatment center, shelter) and asked them to participate in a follow-up interview and to fill in several questionnaires (Time 2). Follow-up interviews were conducted using a laptop and lasted on average 1.5 hr. Participants received a gift voucher of €25. The Dutch Ministry of Security and Justice gave formal consent to approach the formerly institutionalized girls for the study. In addition, the Ethics Committee of the Faculty of Law (CERCO) of VU University approved the study and its procedures.

Measures

Personal and background characteristics. Personal and background characteristics measured at Time 1 were available from participants' treatment files which were constructed by a multi-disciplinary team. Only information relevant to the study is reported here. Treatment files were scored using a structured checklist (Hendriks & Bijleveld, 2004), containing social and demographic characteristics, criminal history, depressive mood, and presence of four of the most common child maltreatment subtypes, namely, neglect (emotional and physical neglect, including lack of supervision and care), CPA, CSA, and witnessing DV. All child maltreatment subtypes were scored (1 = yes, 0 = no) based on reports in the treatment files constructed by professionals, for example, psychologists. Child maltreatment subtypes were scored as '1' when professionals explicitly mentioned CPA, CSA, exposure to DV or neglect in the treatment files. Inter-rater reliability was good for all child maltreatment subtypes; Cohen's κ ranged from .76 (CPA) to 1 (CSA and DV). In addition, a sum score of subtypes of

child maltreatment, cumulative childhood maltreatment (CCM), was established to reflect co-occurrence of subtypes, ranging from 0 to 4. Depressive mood during intake at the institution was scored on a 4-point scale (1 = *none* through 4 = *substantial*) based on explicit reports of professionals of depressive mood in the treatment files. Inter-rater reliability for depressive mood was acceptable (Cohen's $\kappa = .68$). At Time 2, during the interviews, we assessed depressive symptoms and social connectedness. *Depressive symptoms.* We used 19 items of the Center for Epidemiological Studies Scale for Depression (CES-D; Radloff, 1977) to measure depressive symptoms during the prior week (1 = *not at all* through 5 = *very much*). The scale shows high reliability and validity (Bouma, Ranchor, Sanderman, & van Sonderen, 2012). Reliability in this study was excellent (Cronbach's $\alpha = .93$). The mean score across items for every participant (range = 1-5) was used in the analyses, with higher values indicating more severe symptoms of depression.

Social connectedness: employment and romantic relationships. To establish social connectedness participants used a Life History Calendar (LHC) to report whether and when they had experienced important life events (e.g., marriage, living with their partner). The LHC is a tool to collect reliable retrospective information about the timing and sequencing of important life events (Freedman, Thornton, Camburn, Alwin, & Young-DeMarco, 1988; Roberts & Horney, 2010). In this study, we used information on employment and romantic relationships. Participants rated for each year since they were 18 whether they had been employed and/or had had a romantic relationship (1 = *yes*, 0 = *no*). We calculated the mean score across years during the observed time period for every participant to control for age, with higher values indicating more years of employment or romantic relationships over time during the observed years. Thus, individual scores represent the proportion of worked years or years they were in a relationship from age 18 to follow-up.

Relationship quality. Participants currently involved in a romantic relationship rated the quality of their relationship on 10 items derived from the Rochester Youth Development Study (e.g., "How often would you say that you feel that you can really trust your partner?"; see Smith & Thornberry, 1995). Items were rated on a 4-point Likert-type scale ranging from 1 (*never*) to 4 (*often*), with higher values indicating a higher relationship quality (Cronbach's $\alpha = .89$).

Results

Statistical analyses

Descriptive analyses explored child maltreatment subtypes and co-occurrence of maltreatment subtypes in the sample. Zero-order correlations assessed the associations

between all study-related variables. Hierarchical multiple regression analyses were used to examine the effects of child maltreatment subtypes, CCM, and indicators of social connectedness on depression. Depressive mood at Time 1 was controlled for in all analyses. Because indicators of social connectedness may interact to increase the protective effects, regression models also included interactions terms of indicators of social connectedness. For example, females with consistent employment and relationships over time may develop fewer depressive symptoms than females with consistent employment but without consistent relationships. In addition, interaction terms of CCM and social connectedness were added to examine the moderating effect of social connectedness on the link between CCM and depressive symptoms. In models including interaction terms, predictors measured on interval or ratio level were transformed into z scores prior to model entry and interaction terms were created using z scores (Aiken & West, 1991).

Descriptive analyses

Time 1. Ethnic background of the girls was as follows: Dutch (71%), Surinamese (5.6%), Moroccan (1.6%), mixed (15.3%), other (6.5%) and unknown (2.4%). Most girls (73.3%) had medium levels of education, 21.7% had a low level of education, 2.4% had a high level of education and for 2.6% it was unknown. Seventy-five percent of the girls had committed a crime. Most of the girls reported a depressive mood during their stay in the institution (73.4%). On average, girls stayed 13.89 ($SD = 8.10$) months in the institution. They were on average 15.44 ($SD = 1.26$) years old at admission to the institution and left the institution when they were on average 16.57 ($SD = 1.28$) years old.

A large majority of the girls had experienced at least one type of child maltreatment (85.5%), only 18 girls had no report of child maltreatment in their treatment files (14.5%). One third of the girls had experienced CSA (31.5%), half of the girls had experienced CPA (50%), two third was neglected (64.5%), and more than one third was exposed to DV (37.9%). There was a high co-occurrence of subtypes, with a majority of girls (58.9%) reporting two or more subtypes of child maltreatment ($M = 1.84$, $SD = 1.16$). The most common maltreatment profiles were CPA, neglect, and DV, followed by CPA and neglect, and neglect only. The least common profiles were CSA and DV, CPA and DV, and DV only. Child maltreatment profiles were not further examined due to insufficient sample sizes for each profile.

Time 2. At the follow-up interview, participants had an average age of 32.77 years ($SD = 2.53$). The average of depressive symptoms was 2.15 ($SD = 0.81$), indicating that the majority of women experienced moderate levels of depression. Half of the women had completed an education (51.6%), one woman was currently studying, and for 36 women (29.0%) it was unknown whether they had completed an education. Results

on the LHC revealed that on average, women had been employed about half of the time ($M = 0.49$, $SD = 0.36$) and had a romantic relationship for about 70% of the time during the observed period ($M = 0.71$, $SD = 0.27$) between the ages of 18 and 38. At follow-up, 63.7% were currently involved in a romantic relationship and 40.3% were employed. The perceived relationship quality among women involved in a romantic relationship was high ($M = 3.31$, $SD = 0.51$).

Zero-order correlations

As presented in Table 1, neglect was significantly likely to co-occur with exposure to DV ($p < .001$) and CPA ($p = .02$). CCM or other child maltreatment subtypes were not associated with any variables, including depressive mood at Time 1 and depressive symptoms at Time 2. Depressive mood at Time 1 was negatively correlated with depressive symptoms at Time 2 ($p = .01$). More employment over time ($p < .001$) and a higher relationship quality ($p < .001$) were associated with less depressive symptoms at Time 2. In addition, more employment over time ($p = .03$) and having experienced CPA ($p = .004$) were associated with a higher frequency of romantic relationships over time.

Table 1. Zero-Order Correlations Among Study-Related Variables

Variable	1	2	3	4	5	6	7	8	9	10
1. Depressive mood T1	-									
2. CSA	.14	-								
3. CPA	.13	.05	-							
4. DV	.14	.12	.15	-						
5. Neglect	.18	.03	.20*	.34***	-					
6. CCM	.02	.48***	.60***	.67***	.65***	-				
7. Employment	-.16	.01	.13	.10	-.04	.08	-			
8. Romantic relationships	-.12	.04	.26**	.01	-.02	.12	.19*	-		
9. Relationship quality T2	-.09	.13	.02	-.07	-.02	.02	.12	.03	-	
10. Depressive symptoms T2	.23*	.12	-.02	.18	.11	.16	-.33***	-.18	-.41***	-

Note. CSA = child sexual abuse, CPA = child physical abuse, DV = domestic violence, CCM = cumulative child maltreatment. Correlations between categorical variables were calculated with the phi coefficient.

* $p < .05$; ** $p < .01$; *** $p < .001$

Child maltreatment subtypes and depression

Hierarchical multiple regression analysis was used to examine the association between child maltreatment subtypes and depressive symptoms in adulthood. Depressive mood at Time 1 in Step 1 significantly explained 5.2% of the variance ($p = .01$; Table 2). Adding child maltreatment subtypes to the model in Step 2 did not increase explained variance of depressive symptoms, $\Delta R^2 = .04$, $\Delta F(4, 110) = 1.06$, $p = .38$. Thus, child maltreatment subtypes were not associated with depressive symptoms at Time 2 in our sample.

Table 2. Model 1: Hierarchical Linear Regression Model Examining Depressive Symptoms as a Function of Child Maltreatment Subtypes ($n = 116$)

	<i>B (SE B)</i>	<i>B</i>	<i>t</i>	<i>p</i>	<i>R</i> ²	<i>F</i>	<i>df</i>
Step 1					.05*	6.26	1, 114
Depressive mood T1	.20 (.08)	.23	2.50	.01			
Step 2:					.09	2.10	5, 110
Depressive mood T1	.18 (.08)	.21	2.27	.03			
CSA	.11 (.16)	.07	.70	.49			
CPA	-.03 (.15)	-.02	-.23	.82			
DV	.25 (.16)	.15	1.58	.12			
Neglect	.07 (.16)	.04	.41	.68			

Note. CSA = child sexual abuse, CPA = child physical abuse, DV = domestic violence. Significant effects are in bold.

* $p < .05$

Protective effect of social connectedness

In Model 2, we examined the effects of employment and romantic relationships on depressive symptoms in adulthood. In Step 1, depressive mood at Time 1 significantly predicted depressive symptoms at Time 2 ($p = .01$), although CCM was not a significant predictor ($p = .11$). Adding both indicators of social connectedness to the model in Step 2, significantly increased the explained variance in depressive symptoms, $\Delta R^2 = .12$, $\Delta F(2, 111) = 7.84$, $p = .001$ (Table 3). Employment was negatively related to depressive symptoms ($p = .001$), whereas romantic relationships was not a significant predictor ($p = .14$). CCM emerged as a significant predictor ($p = .03$), which indicates that experiencing more subtypes of maltreatment was associated with more depressive symptoms. In the final step, adding interaction terms did not significantly improve the model, $\Delta R^2 = .02$, $\Delta F(3, 108) = .82$, $p = .49$.

In Model 3, we examined the effect of relationship quality in the group of women who were currently involved in a romantic relationship at follow-up ($n = 77$). Although this group is smaller compared with the total sample, they did not significantly differ in depressive symptoms at Time 2 from women who were not in a relationship ($p = .40$). Results showed that employment in Step 1 negatively predicted depressive symptoms ($p = .03$), whereas romantic relationships ($p = .17$), depressive mood at Time 1 ($p = .07$) and CCM ($p = .07$) were not significant predictors (see Table 4). Adding relationship quality in Step 2 significantly improved the model, $\Delta R^2 = .14$, $\Delta F(1, 71) = 14.1$, $p < .001$. Again, CCM emerged as a significant predictor ($p = .04$). Relationship quality was negatively related to depressive symptoms ($p < .001$), whereas the effect of employment was no longer significant ($p = .06$). Adding the interaction term in Step 3 did not improve the model, $\Delta R^2 = .01$, $\Delta F(1, 70) = 1.24$, $p = .27$.

Table 3. Model 2: Hierarchical Linear Regression Model Examining Depressive Symptoms as a Function of Employment and Romantic Relationships (n = 116)

Predictor Variables	B (SE)	B	B (SE)	B	B (SE)	B
Step 1						
Depressive mood T1	.19(.08)	.23*	.14(.08)	.16	.15(.08)	.17
CCM	.12(.07)	.15	.15(.07)	.19*	.16(.07)	.20*
Step 2:						
Employment			-.24(.07)	-.30**	-.24(.07)	-.30**
Romantic relationships			-.11(.07)	-.13	-.09(.07)	-.11
Step 3:						
CCM × Employment					-.08(.07)	-.10
CCM × Romantic relationships					.07(.08)	.08
Employment × Relationships					.04(.08)	.05
R ² =	.07*		.19***		.21**	
F =	4.50		6.44		4.01	
df =	2,113		4,111		7,108	

Note. CCM = cumulative child maltreatment.

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 4. Model 3: Hierarchical Linear Regression Model examining Depressive Symptoms as a Function of Current Romantic Relationship Quality (n = 77)

Predictor Variables	B (SE)	B	B (SE)	B	B (SE)	B
Step 1						
Depressive mood T1	.17(.09)	.20	.15(.08)	.17	.17(.09)	.20
CCM	.16(.09)	.21	.17(.08)	.22*	.18(.08)	.22*
Employment	-.20(.09)	-.24*	-.16(.09)	-.19	-.13(.09)	-.16
Romantic relationships	-.14(.10)	-.16	-.14(.09)	-.16	-.16(.10)	-.17
Step 2:						
Relationship quality T2			-.31(.08)	-.37***	-.30(.09)	-.35***
Step 3:						
CCM × Relationship quality T2					-.09(.08)	-.12
R ² =	.17**		.31***		.32***	
F =	3.80		6.43		5.58	
df =	4,72		5,71		6,70	

Note. CCM = cumulative child maltreatment.

* $p < .05$; ** $p < .01$, *** $p < .001$

Discussion

This study explored the longitudinal associations between child maltreatment and depressive symptoms and the protective effects of social connectedness, including both employment and romantic relationships, in a sample of formerly institutionalized females. Consistent with our hypotheses and the existing literature, a large majority of the females experienced some form of child maltreatment, and co-occurrence of subtypes was high (Dixon et al., 2004; Ford et al., 2013). In contrast with our hypothesis, child maltreatment subtypes were not associated with depressive mood at Time 1 and depressive symptoms at Time 2. Although existing studies provide mixed evidence for a link between maltreatment subtypes and depression in high-risk youth (e.g., Gover & MacKenzie, 2003), our findings may be explained by several factors. First, the high co-occurrence of maltreatment subtypes in our study may have made it difficult to disentangle the effects of subtypes on depressive symptoms. Due to a lack of power, we were unable to examine the effects of different child maltreatment profiles. Second, most females in the study experienced child maltreatment, only 14.5% did not. This restricted range prevented us from examining whether maltreated females were more depressed than non-maltreated females. Consistent with our hypothesis and previous research (Edwards et al., 2003; Radford et al., 2013), we found that cumulative child maltreatment, after controlling for depressive mood at Time 1, employment, and relationships, was associated with more depressive symptoms at Time 2. Thus, women who experienced multiple types of child maltreatment were at higher risk for developing depressive symptoms as adults.

As predicted, indicators of social connectedness were related to depression in adulthood. First, being employed following institutionalization was strongly related to less depression. This is consistent with research indicating that employment is associated with positive mental health outcomes (Paul & Moser, 2009). Importantly, consistent with our hypothesis, employment was a better predictor than romantic relationships. This finding supports our suggestion that employment may provide high-risk females with a more consistent opportunity to feel socially connected and integrated than romantic relationships. However, several alternative mechanisms underlying the effect of employment on depression need to be considered. For example, income and time structure are other benefits of employment related to positive mental health outcomes (Selenko et al., 2011). More research is needed to explore social connectedness as a mechanism underlying the positive effects of employment for mental health.

Second, the results indicate that most females in a relationship at follow-up perceived the quality of their relationship as high. Our finding is surprising in light of evidence that relationships among high-risk and maltreated females are gener-

ally problematic (Colman & Widom, 2004; Lanctôt et al., 2007). However, we only measured relationship quality at Time 2 and thus we do not have information about relationship quality in the years before follow-up. Consistent with our hypothesis, we found that for females in a relationship at follow-up, a high-quality romantic relationship in adulthood was protective for depression. Furthermore, the quality of the relationship was more strongly related to depression than having had romantic relationships, suggesting that only high-quality romantic relationships may have a protective function among high-risk females. This suggests that relationships before follow-up may have been of low quality and therefore not protective of mental health and behavior problems. This is in line with research showing that marital status among high-risk women was not predictive of delinquency and offending patterns (Zoutewelle-Terovan, van der Geest, Liefbroer, & Bijleveld, 2014), indicating that simply having romantic relationships in high-risk females may not provide a feeling of social connectedness to protect them from negative outcomes.

Although indicators of social connectedness were related to depression in adulthood, we did not find significant interaction effects with CCM. In contrast with our hypothesis, this suggests that social connectedness did not moderate the adverse effects of cumulative child maltreatment among formerly institutionalized females. Our findings may be explained by the possibility that variables not assessed in the study are more susceptible to the protective effects of social connectedness than cumulative child maltreatment and subtypes of maltreatment. To illustrate, child maltreatment characteristics, such as abuse severity, duration of abuse, age of onset, perpetrator identity, and use of physical violence may be strong determinants of child maltreatment outcomes (Trickett, Noll, & Putnam, 2011). Also, high-risk females are at risk for experiencing a variety of adverse experiences on top of maltreatment, such as exposure to community violence, loss or death of a caregiver, or suicide attempt by a loved one (Abram et al., 2004; Ford et al., 2013), which may mask the protective effect of social connectedness on outcomes of maltreatment. Future studies examining long-term effects of child maltreatment should control for other adversities.

Strengths and limitations

This study highlights the importance of social connectedness and the impact of child maltreatment on depression among high-risk females. Some limitations of the study need to be considered. First, the correlational nature of the study prevents drawing conclusions regarding causality. To illustrate, it is unclear whether employment promotes positive mental health outcomes, or whether females without mental health problems are more likely to be employed. Nevertheless, research suggests that unemployment plays a causal role in the development of mental health problems, rather than vice versa (Paul & Moser, 2009). Prospective, longitudinal studies should monitor

the development of institutionalized youth after their release to examine directionality of the found links. Second, the effects of child maltreatment may not only be devastating, they are complex and include multiple behavioral, emotional, and developmental problems (e.g., Frederico, Jackson, & Black, 2008). This study focused on depression. Although depression is one of the most common mental disorders associated with different forms of maltreatment and their co-occurrence (e.g., Gilbert et al., 2009), research should consider the complexity of mental problems and their interplay. Third, the generalizability of our findings is limited because we focused only on females. It is unclear whether links between child maltreatment, depression, and the protective effects of social connectedness generalize to males. Fourth, the moderate response rate of our study may indicate a sampling bias. Although analyses indicated some differences between responders and non-responders (e.g., incidence of sexual abuse), there were no differences in employment and psychopathology. We have no information about differences in romantic relationships. In light of these findings, we believe our sample to be representative for institutionalized females. Nevertheless, further empirical research is needed to replicate our findings in larger high-risk samples that include a greater number of women without permanent address.

In addition, some issues regarding our measurements warrant attention. First, child maltreatment and depressive mood at Time 1 were measured using reports of professionals in the participants' treatment files. Although inter-rater reliability was sufficient, future studies should include self-report measures using standardized and normative questionnaires. Second, our scoring procedure of depressive symptoms at Time 2, using the CES-D, was different from the original scoring procedure (Bouma et al., 2012; Radloff, 1977). Therefore, we were unable to compare our mean population score with other populations and use a clinical cut-off score. Third, participants' reports of social connectedness, including employment and romantic relationships, were retrospective. Prospective studies may shed greater light on protective factors for depression following child maltreatment. Despite these limitations, this study offers unique results and indications for the treatment of formerly institutionalized females. To our knowledge, this is the first longitudinal study exploring the link between child maltreatment, depression, and protective factors in the understudied sample of high-risk females.

Conclusions and implications

Our findings highlight the prevalence of maltreatment and the impact of experiencing multiple types of maltreatment on depression among formerly institutionalized females. They also underscore the importance of social connectedness, specifically employment and romantic relationship quality, as protective factors against the development of depressive symptoms in adulthood in formerly institutionalized females. Our findings

have important implications for the treatment of these youth. First, findings imply that practitioners should be aware of the high prevalence of child maltreatment and the risk of developing depression when girls experienced multiple types of maltreatment. Recently, more awareness has been raised for developing effective trauma-focused treatments for high-risk females, and the few studies on the effectiveness of these treatments show promising results (Ford, Steinberg, Hawke, Levine, & Zhang, 2012). Second, they suggest that improving social connectedness among high-risk females enhances their well-being. Thus, treatment should focus on helping them to develop and maintain positive interpersonal relationships. This is in line with research showing the positive effects of relational psychotherapy, which includes strengthening interpersonal relationships, among delinquent females (Ford et al., 2012). Furthermore, results suggest that educational and vocational programs may be particularly valuable to increase opportunities for employment. These programs have shown promising effects in reducing recidivism (Koehler, Lösel, Akoensi, & Humphreys, 2013). This study underlines the importance of educational and vocational programs and suggests a possible extended effect on future mental health among high-risk females. Further development of treatment programs is needed to improve future quality of life for formerly institutionalized females.

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